

AMENDMENTS TO THE CLAIMS

Claim 1 (Currently Amended) An inter-station transmission method used in a mobile communication system comprising a mobile station and a base station operable to return, to the mobile station by means of a TDMA system, a response packet, the response packet being returned by the base station in response to a packet received from the mobile station, and the response packet being returned within a same time slot used for receiving the response packet, wherein the base station includes:

a radio base station operable to demodulate an uplink packet signal received from the mobile station and extract uplink transmission data, and operable to modulate downlink transmission data to be transmitted to the mobile station and generate a downlink packet signal;

a communication control station operable to receive the uplink transmission data from the radio base station, generate downlink transmission data corresponding to the uplink transmission data received from the radio base station and transmit the generated downlink transmission data to the radio base station; and

an inter-station transmission path that establishes a wired connection between the radio base station and the communication control station, and

wherein the inter-station transmission method includes:

in the radio base station, reproducing a clock synchronized with a clock used when the generated downlink transmission data is transmitted from the communication control station;

by means of the reproduced-synchronized clock, transmitting the uplink transmission data from the radio base station to the communication control station, the uplink

transmission data being transmitted, without any changes, in a TDMA frame format used for a radio link between the radio base station and the mobile station; and
in the communication control station, processing the uplink transmission data received from the radio base station in the TDMA frame format.

Claim 2 (Previously Presented) The inter-station transmission method according to claim 1 wherein the downlink transmission data is transmitted, from the communication control station to the radio base station, in the TDMA frame format, and
wherein, in the radio base station, the downlink transmission data received from the communication control station is processed in the TDMA frame format.

Claim 3 (Previously Presented) The inter-station transmission method according to claim 2, wherein the downlink transmission data is transmitted, from the communication control station, in accordance with a predetermined communication control station transmission clock, and

wherein the inter-station transmission method further comprises:
in the radio base station, reproducing a radio base station reception clock synchronized with the predetermined communication control station transmission clock from the downlink transmission data received from the communication control station; and
in the radio base station, processing the downlink transmission data using the radio base station reception clock.

Claim 4 (Previously Presented) The inter-station transmission method according to claim 3, wherein the radio base station reception clock is reproduced in the radio base station using PLL control.

Claim 5 (Previously Presented) The inter-station transmission method according to claim 3, wherein, in the communication control station, a communication control station reception clock, which results from multiplying or dividing the predetermined communication control station transmission clock by n (n is a natural number), is used to receive the uplink transmission data,

wherein, in the radio base station, a radio base station operation clock is generated by multiplying the radio base station reception clock by m (m is an integer greater than 1),

wherein, in the radio base station, the uplink transmission data is transmitted using a radio base station transmission clock that results from multiplying or dividing the radio base station operation clock by k (k is a natural number) and has a frequency synchronized with the communication control station reception clock, and

wherein, a phase difference, which occurs according to a length of the inter-station transmission path, between the radio base station transmission clock and the communication control station reception clock is adjusted by a clock unit of the radio base station operation clock.

Claim 6 (Previously Presented) The inter-station transmission method according to claim 1, wherein, when a response signal is transmitted from the communication control station,

only a payload portion of the response packet is transmitted to the radio base station, and wherein, in the radio base station, transmission of the response packet begins with a predetermined timing using header information previously retained, without waiting for an arrival of the payload portion from the communication control station.

Claim 7 (Previously Presented) The inter-station transmission method according to claim 3, wherein a plurality of radio base stations are respectively connected to the communication control station via a plurality of respective inter-station transmission paths, and wherein each radio base station of the plurality of radio base stations adjusts, using a respective clock unit of a respective radio base station operation clock, a delay time difference, which occurs according to a length of the respective inter-station transmission path, between a downlink transmission path delay and a predetermined transmission path delay.

Claim 8 (Previously Presented) The inter-station transmission method according to claim 1, wherein a plurality of radio base stations are respectively connected to the communication control station via a plurality of respective inter-station transmission paths, wherein, in the communication control station, a plurality of pieces of uplink transmission data, which are respectively outputted from each radio base station of the plurality of radio base stations and which correspond to a same packet received from the mobile station, are received in a predetermined slot, wherein, in the communication control station, a reception timing of uplink transmission data is detected, the uplink transmission data corresponding to a packet having been first

received, and

wherein, in the communication control station, a selection process is performed only on uplink transmission data that has been received before a predetermined period of time has passed after the reception timing.

Claim 9 (Previously Presented) The inter-station transmission method according to claim 8, wherein the predetermined period of time is set according to a length of an area covered by the plurality of radio base stations.

Claim 10 (Previously Presented) The inter-station transmission method according to claim 8, wherein the predetermined period of time is set according to a length of a longest inter-station transmission path among the plurality of inter-station transmission paths.

Claim 11 (Previously Presented) The inter-station transmission method according to claim 3, wherein in the communication control station, the downlink transmission data, into which dummy data for reproducing the radio base station reception clock is inserted, is transmitted in a period which is within the TDMA frame and in which a channel data packet to be transmitted is not present.

Claim 12 (Currently Amended) A radio base station monitoring method used in a mobile communication system comprising a mobile station and a base station operable to return, to the mobile station by means of a TDMA system, a response packet, the response packet being

returned by the base station in response to a packet received from the mobile station, and the response packet being returned within a same time slot used for receiving the response packet, wherein the base station includes:

a radio base station operable to demodulate an uplink packet signal received from the mobile station and extract uplink transmission data, and operable to modulate downlink transmission data to be transmitted to the mobile station and generate a downlink packet signal;

a communication control station operable to receive the uplink transmission data from the radio base station, generate downlink transmission data corresponding to the uplink transmission data received from the radio base station and transmit the generated downlink transmission data to the radio base station; and

an inter-station transmission path that establishes a wired connection between the radio base station and the communication control station, and

wherein the radio base station monitoring method includes:

in the radio base station, reproducing a clock synchronized with a clock used when the generated downlink transmission data is transmitted from the communication control station;

in the radio base station, generating monitoring data for notifying a state of the radio base station to the communication control station;

in the radio base station, time division multiplexing the monitoring data into the uplink transmission data with a slot timing that is only allocated to a downlink;

in the radio base station, by means of the reproduced-synchronized clock, transmitting the uplink transmission data and the monitoring data to the communication control

station, the uplink transmission data and the monitoring data being transmitted, without any changes, in a TDMA frame format used for a radio link between the radio base station and the mobile station;

in the communication control station, processing the uplink transmission data received from the radio base station in the TDMA frame format; and

in the communication control station, monitoring the state of the radio base station using the monitoring data.

Claim 13 (Currently Amended) A mobile communication system comprising a mobile station and a base station operable to return, to the mobile station by means of a TDMA system, a response packet, the response packet being returned by the base station in response to a packet received from the mobile station, and the response packet being returned within a same time slot used for receiving the response packet,

wherein the base station includes:

a radio base station operable to demodulate an uplink packet signal received from the mobile station and extract uplink transmission data, and operable to modulate downlink transmission data to be transmitted to the mobile station and generate a downlink packet signal;

a communication control station operable to receive the uplink transmission data from the radio base station, generate downlink transmission data corresponding to the uplink transmission data received from the radio base station and transmit the generated downlink transmission data to the radio base station; and

an inter-station transmission path that establishes a wired connection between the

radio base station and the communication control station,
wherein the radio base station reproduces a clock synchronized with a clock used when
the generated downlink transmission data is transmitted from the communication control station;
wherein the radio base station transmits, by means of the reproduced-synchronized clock, to the communication control station, the uplink transmission data, the uplink transmission data being transmitted, without any changes, in a TDMA frame format used for a radio link between the radio base station and the mobile station,
wherein the communication control station processes the uplink transmission data received from the radio base station, in the TDMA frame format, and transmits, to the radio base station, the downlink transmission data in the TDMA frame format, and
wherein the radio base station processes the downlink transmission data received from the communication control station, in the TDMA frame format.

Claim 14 (Previously Presented) The mobile communication system according to claim 13, wherein the communication control station includes:

a signal generating unit operable to generate (i) a communication control station transmission clock for providing a transmission timing of the downlink transmission data and (ii) a communication control station reception clock for providing a reception timing of the uplink transmission data;
a data generating unit operable to (i) generate, in accordance with the communication control station transmission clock, the downlink transmission data and (ii) transmit the downlink transmission data; and

a reception unit operable to receive, in accordance with the communication control station reception clock, the uplink transmission data, and

wherein the radio base station includes:

a reproduction unit operable to reproduce, from the downlink transmission data received from the communication control station, a radio base station reception clock and a radio base station transmission clock, the radio base station reception clock and the radio base station transmission clock being synchronized with the communication control station transmission clock; and

a radio unit operable to (i) process the downlink transmission data using the radio base station reception clock reproduced in the reproduction unit and (ii) process the uplink transmission data using the radio base station transmission clock reproduced in the reproduction unit.

Claim 15 (Previously Presented) The mobile communication system according to claim 14, wherein the radio base station further includes an adjusting unit operable to control an amount of overall transmission delays of an entire system by adjusting a phase difference, which occurs according to a length of inter-station transmission paths of the entire system, between the radio base station transmission clock and the communication control station reception clock.

Claim 16 (Previously Presented) The mobile communication system according to claim 14, wherein a plurality of radio base stations are respectively connected to the communication control station via a plurality of respective inter-station transmission paths,

wherein, in the communication control station, the reception unit is operable to receive, in a predetermined slot, a plurality of pieces of uplink transmission data, which are respectively outputted from each radio base station of the plurality of radio base stations and which correspond to a same packet received from the mobile station, and

wherein the communication control station further includes:

a detection unit operable to detect a reception timing of uplink transmission data, the uplink transmission data corresponding to a packet having been first received; and

a selection unit operable to perform a selection process only on uplink transmission data that has been received before a predetermined period of time has passed after the reception timing.

Claim 17 (Previously Presented) The mobile communication system according to claim 14, wherein the data generating unit of the communication control station generates the downlink transmission data, into which dummy data for reproducing the radio base station reception clock is inserted, and transmits the downlink transmission data in a period which is within the TDMA frame and in which a channel data packet to be transmitted is not present.